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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/587,506

07/27/2006

Knud Thomsen

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EXAMINER

SCHNEIDER, CRAIG M

ART UNIT

PAPER NUMBER

3753

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/587,506	Applicant(s) THOMSEN, KNUD	
	Examiner CRAIG M. SCHNEIDER	Art Unit 3753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 11-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 11-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 July 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/27/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to because the legend "Figure 1" must be removed from the drawing. When only one figure is submitted with an application, it is not given a figure number (37 CFR 1.84(u)(1)). Further the specification needs to be corrected to refer to the figure and not Figure 1.
2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 14, 20, 22. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claim 6 is objected to because of the following informalities: The claim needs to end with a period. Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 3, 4, 7, and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Schlecht et al. (5,605,174).

Schlecht et al. disclose a solid/liquid interface comprising a liquid facing surface (inside surface of 20), wherein the surface comprises smooth (84) and non-smooth structures (79), wherein the non-smooth structures are arranged to maintain gas bubbles proximate to the surface. The maintaining gas bubbles proximate to the surface is functional language and the structure that has been indicated is capable of performing this.

Regarding claim 3, the non-smooth structures comprise at least one protrusion arranged on the surface extending in a direction away from the surface. The entire structure (79) is the protrusion.

Regarding claim 4, the at least one protrusion extends at an angle as seen in Figure 5 to the surface thereby cooperating with flat portions of the surface so as to define a recess (area where 79 extends to meet 84) arranged to maintain at least one bubble proximate to the surface.

Regarding claim 7, the surface is made of metal per the hatching in Figure 5.

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6. Claims 1-8 and 11, 12, 14-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Fulton (3,827,388).

Fulton disclose a solid/liquid interface comprising a liquid facing surface (27), wherein the surface comprises smooth (33) and non-smooth structures (34), wherein the non-smooth structures are arranged to maintain gas bubbles proximate to the surface (the vertical riser will create an eddy current that will maintain the gas bubbles proximate the surface)(col. 5, lines 4-63).

Regarding claims 2 and 5, bubble source means (45) arranged to produce bubbles proximate to the surface.

Regarding claim 3, the non-smooth surface (34) protrudes from the smooth surface (27) as indicated in Figure 5.

Regarding claim 4, the protrusion as indicated above and as seen in Figure 5 extends at an angle from the smooth surface (27) and maintains an air bubble proximate to the surface.

Regarding claim 6, the bubble source (45) further comprises a cavity (50) arranged between the feeding duct (46) and the outlet (51) at the surface so as to define a gas bleeding hole.

Regarding claims 7 and 16, the surface is made of metal per the hatching in Figure 5.

Regarding claim 11, the process is clearly anticipated per the reference and particularly by Figure 5.

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7. Claims 1-8 and 11-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Petrov et al. (3,659,542).

Petrov et al. disclose a solid/liquid interface comprising a liquid facing surface (1), wherein the surface comprises smooth (area of 1 in between the steps 5) and non-smooth structures (5), wherein the non-smooth structures are arranged to maintain gas bubbles proximate to the surface (col. 1, line 64 to col. 3, line 11).

Regarding claims 2 and 14, bubble source means (7) arranged to produce bubbles proximate to the surface.

Regarding claim 3, the non-smooth surface (5) is a protrusion arranged on the surface extending in a direction away from the surface.

Regarding claims 4 and 12, the recess is the area between 6 and 1 that 8 is located inside of as seen in Figure 3 and this recess maintains an air bubble as indicated in Figure 7.

Regarding claim 5, the bubble source comprises at least one gas feeding duct arranged such that its outlet is proximate to the surface as can be seen in Figure 3.

Regarding claims 6 and 15, the bubble source further comprises a cavity (area between the feeding duct and the outlet) arranged between the feeding duct (area above 7 in Figure 3) and the outlet (area of 7 that is flush with the surface 1) at the surface so as to define a gas bleeding hole.

Regarding claims 7 and 16, the surface is made of metal per the hatching in Figure 3.

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Regarding claim 11, the process is clearly anticipated per the reference and particularly by Figure 5.

Regarding claim 13, the non-smooth surface further comprises a protrusion extending away from the surface and towards the liquid at an angle sufficient to form a cavity (area between 6 and 1 that 8 is located in) between the protrusion and surface of sufficient size to accommodate at least one bubble therein as seen in Figure 7.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lantz (4,528,931) discloses structure that captures air to facility movement through water. Takahashi (2001/0022152) discloses an air bubble device to decrease frictional resistance..

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CRAIG M. SCHNEIDER whose telephone number is (571)272-3607. The examiner can normally be reached on M-F 8:00 -4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Greg Huson can be reached on (571) 272-4887. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/C. M. S./
Examiner, Art Unit 3753
January 15, 2009

/John Rivell/
Primary Examiner, Art Unit 3753